D 101.11:11-6625-399-12
TM 11-6625-399-12, Operator...

6625-399-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATION MAINTENANCE MANUAL

GENERATOR SIGNAL SG-298/U

P90-0131

HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1961

A91009123A

READEX FICHE best copy available

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful when working on the 208- and 125-volt plate and power supply circuits, or on the 115-volt ac line connections. Serious injury or death may result from contact with these points.

DON'T TAKE CHANCES

TECHNICAL MANUAL
No. 11-6625-399-12

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *28 August 1961*

Operator and Organizational Maintenance Manual
GENERATOR, SIGNAL SG-298/U

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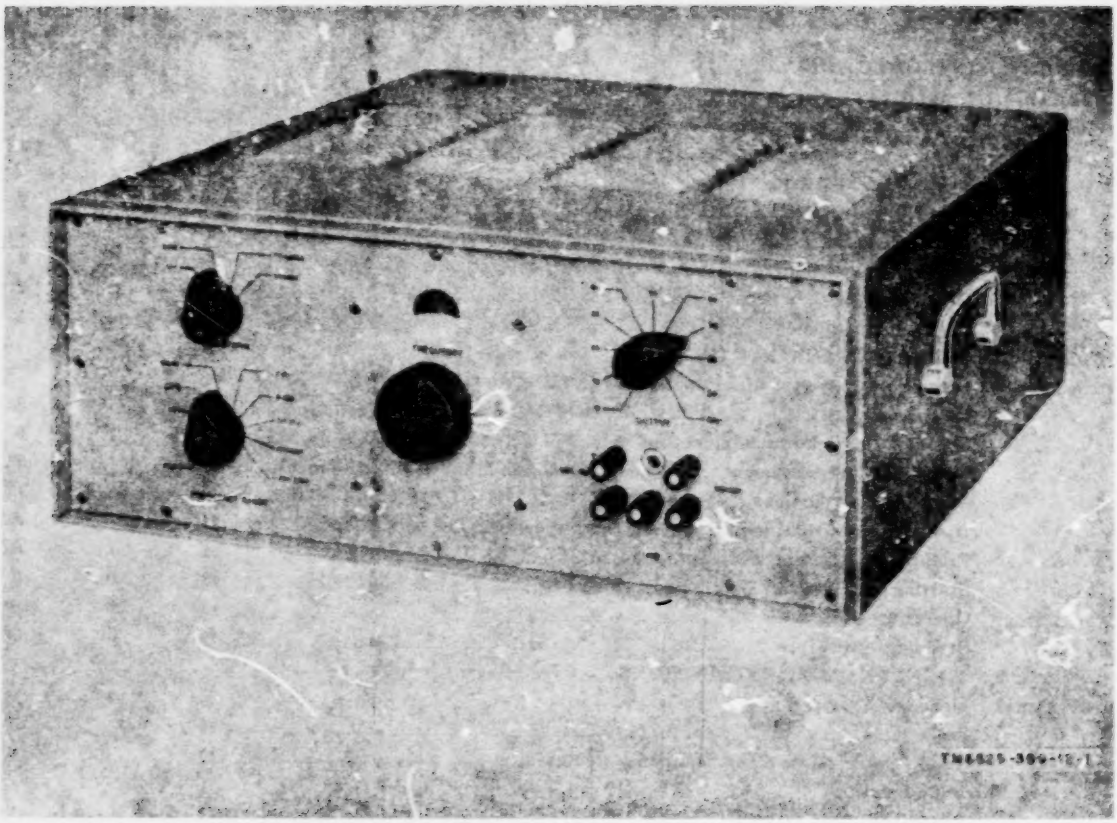

Figure 1. Generator, Signal SG-298/U.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Generator, Signal SG-298/U and covers its installation, operation, and organizational maintenance. It includes operation under usual conditions, cleaning and inspection of the equipment, and replacement of parts available to organizational maintenance. Generator, Signal SG-298/U will be referred to as the signal generator.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N.J. as prescribed in AR 700-38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700-58 (Army).

c. Preventive Maintenance Forms (fig. 6 and 7). Prepare DA Form 11-266 (Maintenance Check List for Signal Equipment (Test Equipment)), in accordance with instruction on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Forth Monmouth, N. J., with comments on parts listings.

e. Comments on Manual. Forward all other comments on this publication direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Generator, Signal SG-298/U is a precision, low-frequency signal generator used to provide sine, square, or triangular waves from 0.008 to 2,000 cycles per second (cps) and variable in amplitude from 0 to 30 volts peak to peak. The direct current (dc) reference level of the output signals is adjusted to zero volts for normal operation, but it can be varied from +20 to −20 volts if required. These precision signals are used to test and calibrate electronic equipment. A reference square wave, 10 volts peak-to-peak is available for synchronizing purposes.

4. Technical Characteristics

Signal output data:

Types of output	Sine wave, square wave, and triangular wave.
Frequency range	Continously variable from 0.008 to 2,000 cps in the following ten ranges: 0.008-0.1, 0.02-0.2, 0.08-1, 0.2-2, 0.8-10, 2-20, 8-100, 20-200, 80-1,000, and 200-2,000.
Output impedance	4,000 ohms.
Amplitude	Variable from 0 to 30 volts peak to peak across a 4,000-ohm load.
Sine-wave distortion	Less than 1% up to 1,000 cps. Less than 2% from 1,000 to 2,000 cps.

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Square-wave risetime and falltime..... Approx 2 microseconds.
Reference square-wave amplitude.... Approx 10 volts peak to peak.
Square-wave frequency response. Within 0.2 db.
Dial calibration..... Dual, linear with an accuracy less than 2%.

Input power requirement:
Voltage..... 115/230 volts ±10%, single phase, ac.
Frequency.....50 to 1,000 cps.
Power.....100 watts.

Special features.....Transient-free voltages down to 0.008 cps.
Isolated output, either terminal may be grounded.

Number of tubes.....10.
Mounting.....Bench.

Physical details:
Weight, unpacked.... 21 pounds.
Width.....17 in.
Height..... 7 in.
Depth.....14.25 in.
Construction.....Aluminum chassis, panel, cover, and all interior sheet metal.
Component mounting. Majority of circuitry and components mounted on three fiber plug-in circuit boards. Receptacle for cards mounted on chassis assembly. Necessary card interconnections made through receptacles with no direct component connection on any area of cards.

5. Components of Generator, Signal SG-298/U

a. Components.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Generator, Signal SG-298/U	7	14.25	17	21
2	TM 11-6625-399-12				
1 set	Running spares (*b* below)				

b. Running Spares.

Quantity	Item	Reference symbol
1	Tube 6U8A	V1
		V2
		V3
1	Tube 6BQ7A	V6
1	Tube 12AT7WA	V4
1	Tube 6BH6	V8
		V9
1	Tube 5651WA	V10
1	Tube 6BX7GT	V7
1	Tube 12AX7	V5
1	Lamp MS-15571-8	DS1
6	Fuse MS-90078-11, 1 ampere, 115 volts	F1

6. Description of Generator, Signal SG-298/U

a. The signal generator is a compact, precision test instrument use to provide accurate, stable, low-frequency sine-wave, square-wave, and triangular-wave outputs. Output connections and controls are mounted on the front panel for convenience of operation. The two-color frequency dial has dual linear calibrations to provide easily seen incremental dial settings. An etched hairline on the inside of the dial window limits the possible parallax error to a maximum of 0.2 percent. The majority of the parts are mounted on plug-in circuit boards to allow efficient inspection and troubleshooting techniques.

b. Power is applied through a line cord that is permanently attached to the rear of the unit. A line fuse is mounted on the rear of the

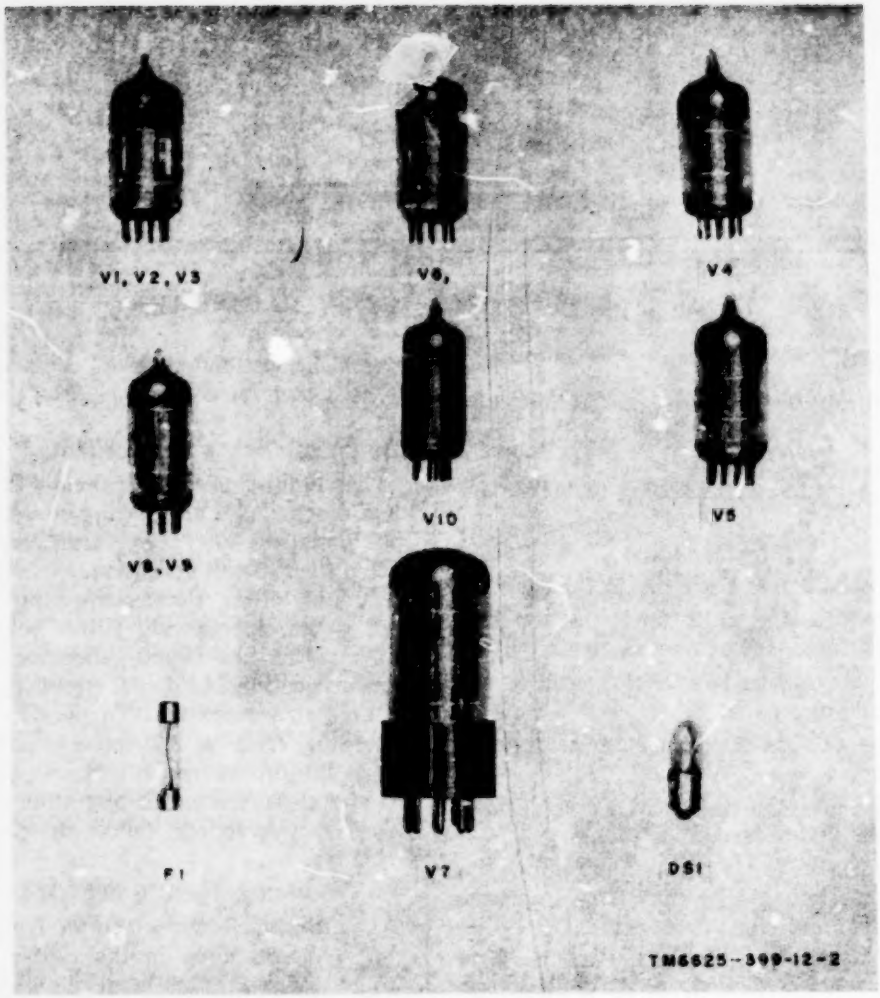


Figure 2. Generator, Signal SG-298/U, running spares.

chassis. The signal generator is normally delivered connected for 115-volt operation and requires a 2-ampere, 115-volt fuse. Connections to the power transformer must be changed (par. 10) for operation on 230 volts. A 1-ampere, 230-volt, slow-blow fuse must be used for 230-volt operation.

7. Additional Equipment Required

No other equipment is required to operate the signal generator other than a standard 115/230-volt, 50 to 1,000-cps power source. To view and record the output of the signal generator, a parallel connection may be made to an oscilloscope.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking

a. Packaging Data. When packed for shipment, the signal generator is placed in a fiberboard box and packed in a wooden box. A typical shipping box and packing materials are shown in figure 3.

b. Removing Contents.

(1) Cut and fold back the metal bands.

(2) Remove the nails from the top and one side of the box with a nailpuller.

(3) Remove the box that contains the running spares.

(4) Remove and open the outer corrugated carton.

(5) Remove the technical manuals and the inner corrugated carton.

(6) Open the inner carton and remove the packing material, humidity indicator card, and signal generator.

Note. The humidity indicator card has three blue desiccant spots. At 77° F, the blue spots will turn pink at the following relative humidities:

Spot	Relative humidity	Comment
Top	65%	Dry Equipment thoroughly before operating
Middle	40%	Check for condensation; change desiccant.
Bottom	30%	Check equipment for mildew.

9. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, refer to paragraph 2.

b. Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (para 5) as a general check.

10. Installation of Equipment

The signal generator is factory-shipped with all tubes and the alternating-current (ac) line fuse installed. The power transformer is connected for 115-volt operation. No installation instructions other than connecting the power cord to an appropriate power source are required. Place the signal generator at any convenient location, but do not expose it to moisture or excessive vibration. To operate the signal generator from a 230-volt ac power source, follow the procedures in *a* below. To reconnect the signal generator for operation from a 115-volt ac power source, follow the procedures in *b* below.

a. Connection for 230-Volt Operation.

(1) Remove three screws from the front panel (one in the center of the top edge and one near the center of each side).

(2) Remove four screws from the bottom of the unit (one in each corner).

(3) Slide the cover back and lift it up to remove it from the panel-chassis assembly.

(4) Remove the jumpers between terminals 1 and 3 and between terminals 2 and 4 of the power transformer (fig. 4).

(5) Connect a jumper between terminals 2 and 3.

(6) Replace the cover and secure it with the seven screws removed in (1) and (2) above.

(7) Replace the fuse (par. 22) with a 1-ampere, slow-blow, 230-volt fuse.

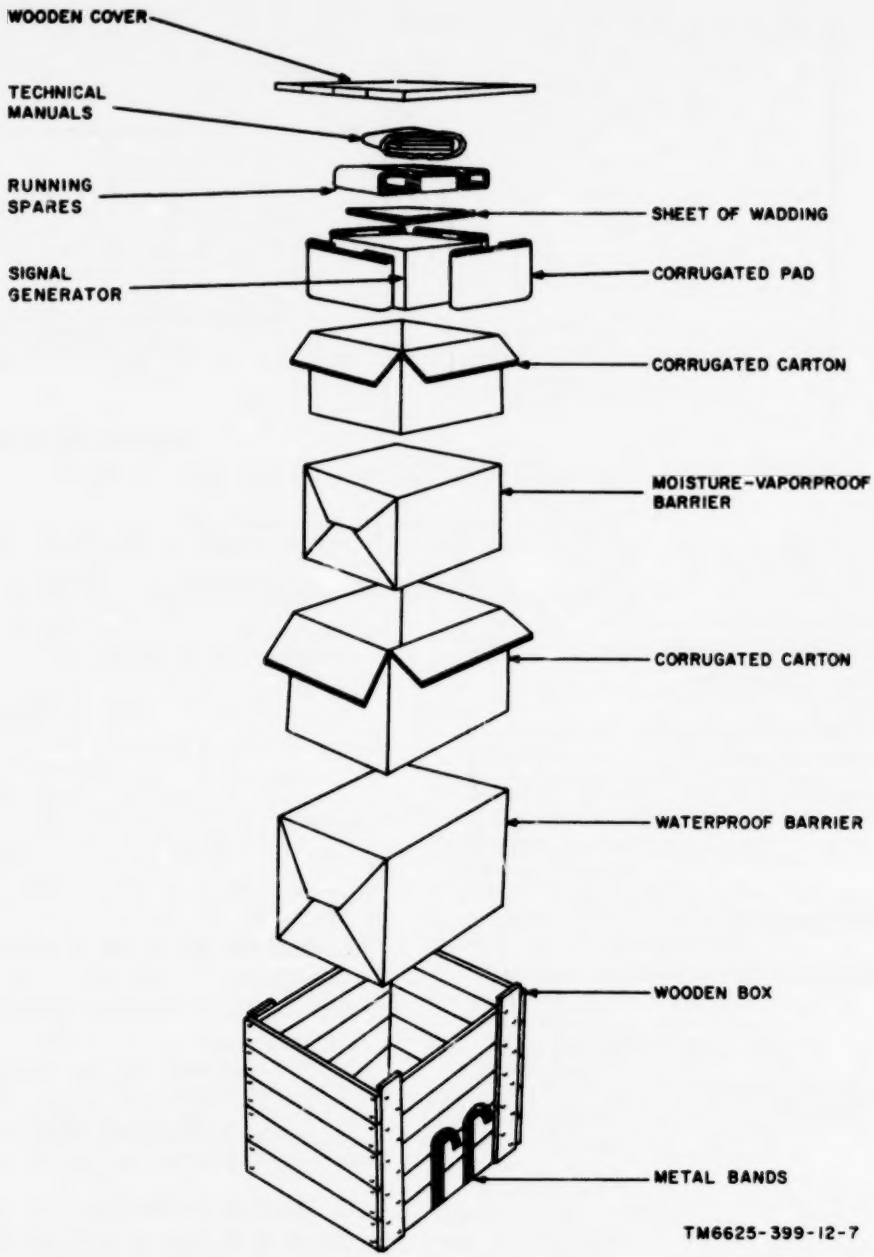


Figure 3. Generator, Signal SG-298/U, typical packaging.

b. Connection for 115-Volt Operation.

(1) Remove the cover (*a*(1) through (3) above).

(2) Remove the jumper between terminals 2 and 3 of the power transformer (fig. 4).

(3) Connect a jumper between terminals 1 and 3 and another jumper between terminals 2 and 4.

(4) Replace the cover.

(5) Replace the fuse (par. 22) with a 2-ampere, 115-volt fuse.

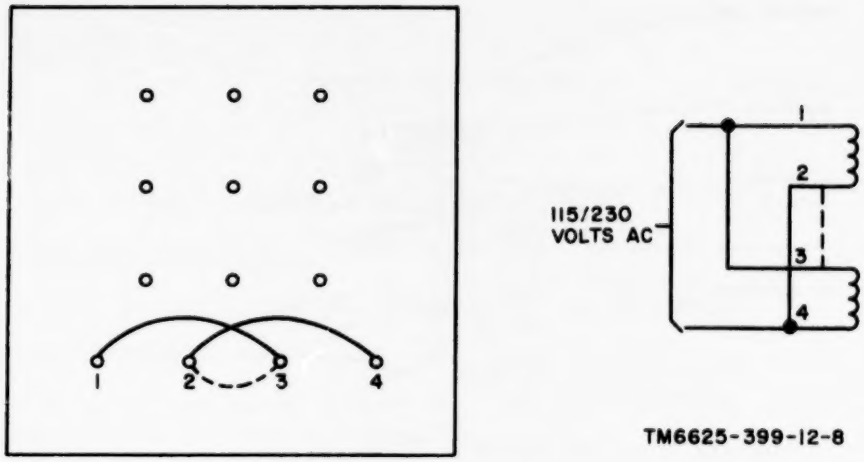


Figure 4. Power Transformer connections.

Section II. OPERATING INSTRUCTIONS

11. Operating Controls, Indicators, and Output Connectors
(fig. 5)

Control, indicator, or connector	Function
WAVEFORM switch	Provides power on-off control and selects sine-, square-, or triangular-wave output.
FREQUENCY RANGE switch	Selects desired frequency band.
FREQUENCY control	Tunes to desired frequency within band selected by FREQUENCY RANGE switch.
FREQUENCY dial	Dual calibration dial indicates frequency selected. Colors correspond to FREQUENCY RANGE positions. Dial light indicates power is on.
OUTPUT control	Adjusts amplitude of output from 0 to 100% of 30 volts.
OUTPUT terminals	Output signal obtained between upper and lower terminals; both are isolated from ground. Either terminal may be grounded.
REF. ⊣⊢ terminals	Reference square-wave output, 10 volts peak to peak, obtained between upper and lower binding posts.
Dc balance	Adjusts the dc reference level of the output signals.
GND terminal	Chassis ground.

12. Preliminary Starting Procedure

Perform the preliminary operations listed below before starting the equipment as described in paragraph 13.

a. Set the WAVEFORM switch at OFF.

b. Set the OUTPUT control at 0.

c. Connect the signal generator power input cable to an appropriate power source.

13. Starting Procedures

Make sure the controls are set as required by the preliminary starting procedure (par. 12). Perform the steps in *a* through *c* below. If an abnormal indication is obtained during the starting procedure, refer to the equipment performance checklist (par. 20*c*) for corrective measures.

a. Set the WAVEFORM switch at SINE, SQUARE, or TRIANGLE. The FREQUENCY dial indicator should light.

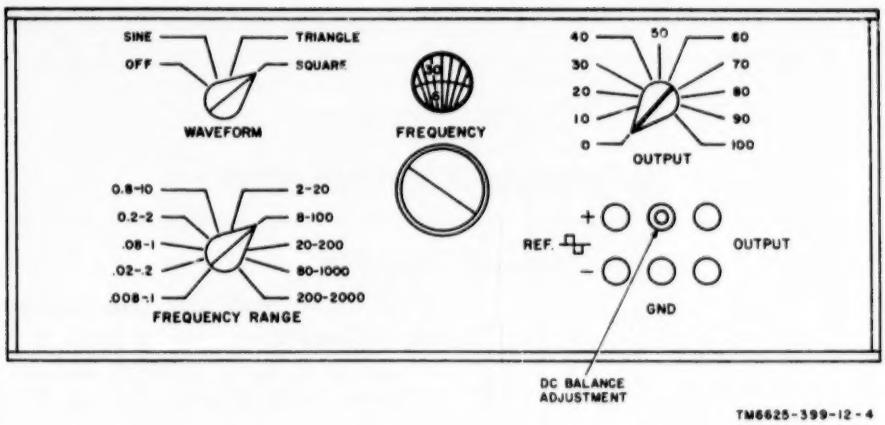


Figure 5. Front panel controls, indicators, and output connectors.

b. Allow the equipment to warm up for 1 minute before proceeding.

c. Connect an oscilloscope to the REF. ⊓⊔ output jacks. A square wave of approximately 10 volts peak-to-peak must be observed.

14. Operating Procedures

Start the equipment (par. 13) and then perform the following instructions, as applicable, to obtain the desired output signal.

a. Select the desired type of output signal by setting the WAVEFORM switch at SINE, TRIANGLE, or SQUARE.

b. Set the FREQUENCY RANGE switch to correspond to the frequency range desired.

c. Adjust the FREQUENCY dial to obtain the exact frequency desired within the frequency range selected.

Note. The frequency of the output signal is controlled by the setting of the FREQUENCY RANGE switch and the FREQUENCY dial indicator. The FREQUENCY RANGE switch position markings are colored to indicate the dial to be used in each switch position. The white calibrations on the black dial (8 to 100) correspond to the ranges of 0.008-0.1, 0.08-1, etc, marked in black on the FREQUENCY RANGE switch and the red calibrations on the white dial (2-20) correspond to the ranges of 0.02-0.2, 0.2-2, etc, marked in red on the FREQUENCY RANGE switch.

d. Connect the signal generator output to the equipment being tested with suitable test leads. Either terminal may be grounded.

e. Adjust the OUTPUT control for the desired peak-to-peak amplitude.

Notes.

1. The dc reference level of the output signal can be varied from +20 to −20 volts if necessary by means of the dc balance control (fig. 5).

2. The reference square-wave output can be used for synchronizing purposes if required.

15. Stopping Procedure

Stop the signal generator by setting the OUTPUT control at 0 and placing the WAVEFORM switch at OFF.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. GENERAL

16. Scope

The following is a list of duties normally performed by organizational (first and second echelon) maintenance personnel on Generator, Signal SG-298/U:

a. Preventive maintenance (par. 18).

b. Visual inspection (par. 19).

c. Equipment performance checks (par. 20).

d. Replacement of tubes (par. 21).

e. Replacement of dial lamp (par. 22).

f. Replacement of fuse (par. 22).

17. Tools, Materials, and Test Equipment Required

A list of parts normally stocked for maintenance is contained in appendix III of this manual. The only tool required is a Phillips screwdriver. Materials and test equipment required for maintenance are listed below.

a. Materials.

(1) Cleaning Compound (Federal stock No. 7930-395-9542).

(2) Cleaning cloth or waste material.

(3) Sandpaper (fine).

b. Test Equipment.

Oscilloscope AN/USM-50 or equivalent.

Section II. MAINTENANCE

18. Preventive Maintenance

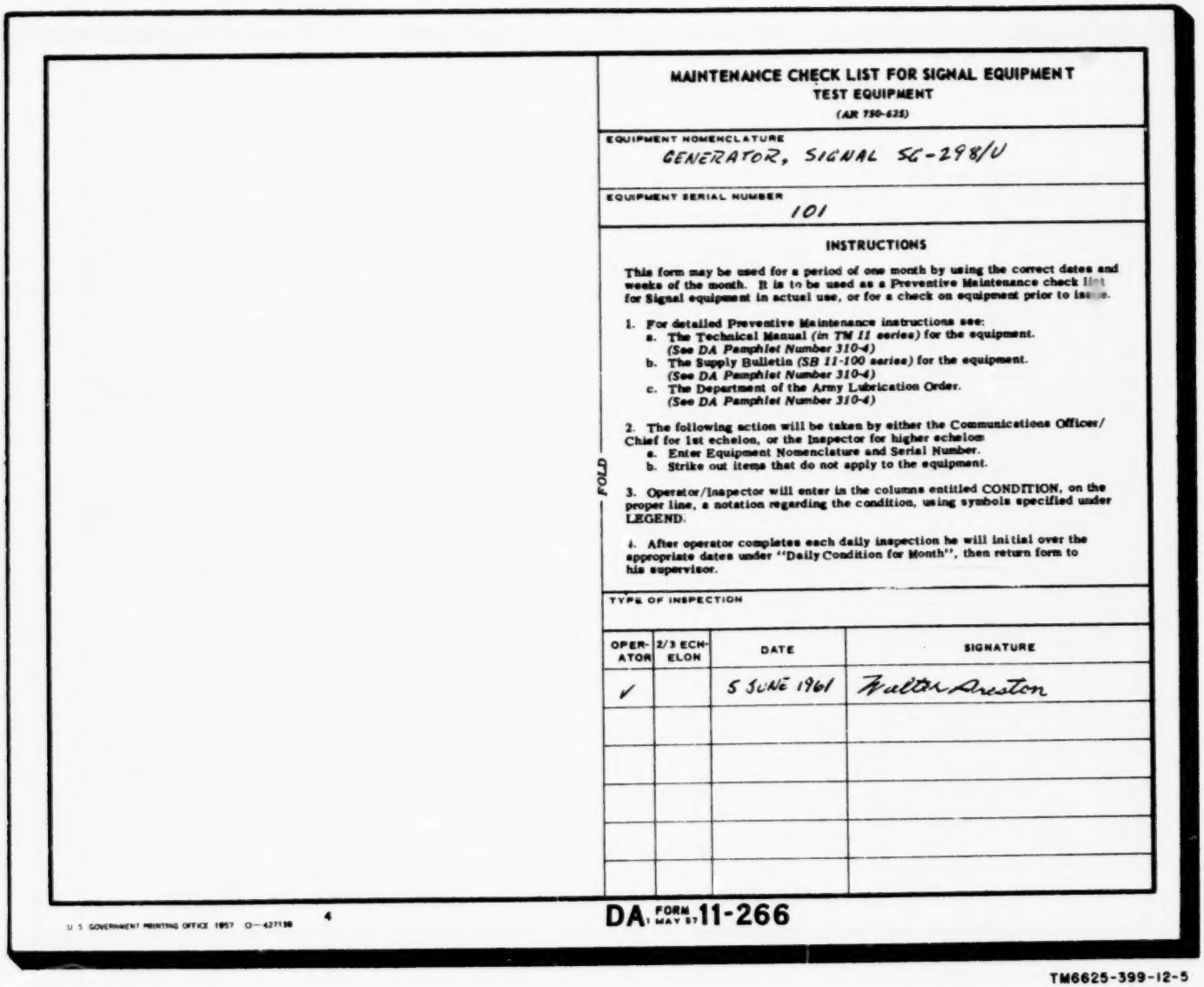
a. DA Form 11-266. DA Form 11-266 (fig. 6 and 7) is a preventive maintenance checklist for use by organizational maintenance personnel. Items not applicable to the equipment are lined out in the figure.

b. Items. The information shown in this subparagraph is supplementary to DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Warning: **Disconnect all power before performing the following procedures. After power is disconnected some capacitors may retain dangerous voltages. Before touching exposed electrical parts, discharge power supply capacitors. When maintenance is completed, replace the equipment in its case, reconnect the power, and check for satisfactory operation.**

Item	Maintenance procedures
1	Remove dust, dirt, moisture, or grease from the housing and front panel. If necessary, dampen a cloth with cleaning compound and wipe the equipment. Dry the equipment with a clean lint-free cloth.
2	Make certain that all knobs are correctly positioned and that the setscrews are tight.
3	Make certain that all cover and retaining screws are tight and free of corrosion. Check the case and all controls and indicators for evidence of damage or excessive wear.
5	Repair any cuts in the power-cord insulation by covering with rubber tape and then friction tape.
12	Make certain that the holddowns of the electron tubes are secure and the plug-in cards (fig. 8) are fully in place.
16	Check to see that the receptacles of the plug-in cards show no moisture, corrosion, or cracks. Make certain they form good contact to the plug end of the circuit card.
19	Inspect the power supply capacitors for any signs of bulging or leakage. Inspect the plug-in cards as well as the components for evidence of overheating, chips, or cracks. Any discoloration of the material is evidence of overheating.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near open flame. Provide adequate ventilation.**



MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE: GENERATOR, SIGNAL SG-298/U

EQUIPMENT SERIAL NUMBER: 101

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelons
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓		5 JUNE 1961	Walter Preston

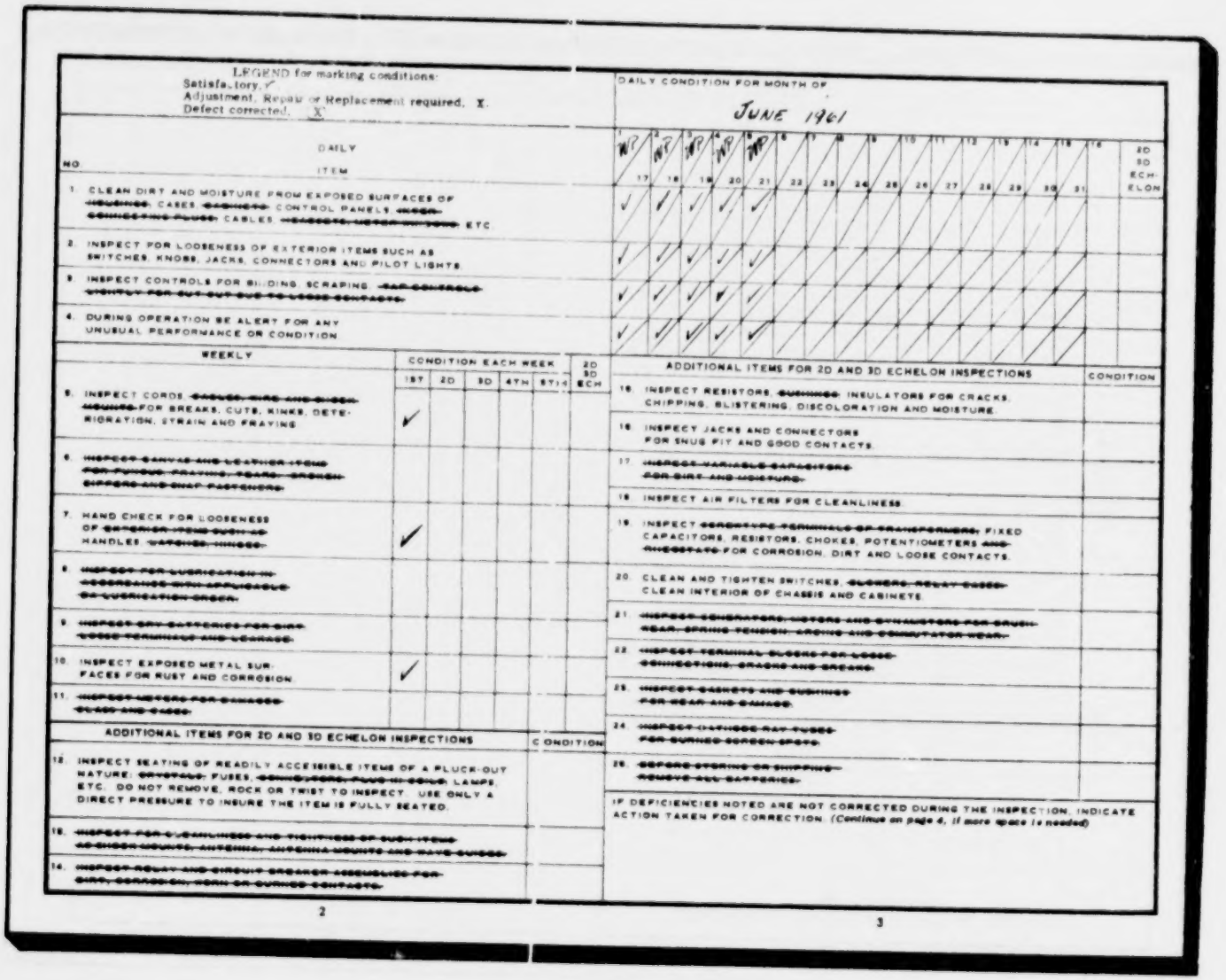
4

U S GOVERNMENT PRINTING OFFICE 1957 O—427138

DA FORM 1 MAY 57 11-266

TM6625-399-12-5

Figure 6. DA Form 11-266, pages 1 and 4.



LEGEND for marking conditions:
Satisfactory, ✓
Adjustment, Repair or Replacement required, X.
Defect corrected, X

DAILY CONDITION FOR MONTH OF JUNE 1961

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2D 3D ECHELON
		NP	NP	NP	NP	NP												
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF [redacted], CASES, [redacted] CONTROL PANELS, [redacted] CONNECTING PLUGS, CABLES, [redacted] ETC.	✓	✓	✓	✓	✓												
2	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, CONNECTORS AND PILOT LIGHTS.	✓	✓	✓	✓	✓												
3	INSPECT CONTROLS FOR BINDING, SCRAPING, [redacted]	✓	✓	✓	✓	✓												
4	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓												

	WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5	INSPECT CORDS, [redacted] FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING.	✓					
6	[redacted]						
7	HAND CHECK FOR LOOSENESS OF [redacted] HANDLES.	✓					
8	[redacted]						
9	[redacted]						
10	INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					
11	[redacted]						

	ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12	INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE; [redacted] FUSES, [redacted] LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	
13	[redacted]	
14	[redacted]	

	ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
16	INSPECT RESISTORS, [redacted] INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	
16	INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.	
17	[redacted]	
18	INSPECT AIR FILTERS FOR CLEANLINESS.	
19	INSPECT [redacted] FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND [redacted] FOR CORROSION, DIRT AND LOOSE CONTACTS.	
20	CLEAN AND TIGHTEN SWITCHES, [redacted] CLEAN INTERIOR OF CHASSIS AND CABINETS.	
21	[redacted]	
22	[redacted]	
23	[redacted]	
24	[redacted]	
25	[redacted]	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

2 3

TM6625-399-12-6

Figure 7. DA Form 11-266, pages 2 and 3.

19. Visual Inspection

Before operating the equipment, inspect it. Inspection may save repair time and may also avoid further damage. Inspect the following for obvious defects:

a. The seating of the plug-in circuit cards.

b. The connections made to the front panel binding posts.

c. The condition of the power plug-connector and fuse.

d. The condition of component connections and wiring.

e. The seating of tubes in sockets.

20. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the second echelon repairman can perform are given in the *Corrective measures* column. When using the checklist, start at the beginning and follow each step in order. If the corrective measures indicated do not repair the equipment, troubleshooting is required by a higher echelon. Note on the repair tag, how the equipment performed and the corrective measures that were taken.

b. Procedure. Place the signal generator in operation (*c* below).

c. Checklist.

	Step	Action or condition	Normal indications	Corrective measures
PREPARATORY	1	Set WAVEFORM switch at OFF.		
	2	Set OUTPUT control at 0.		
	3	Connect power cord to appropriate power source receptacle.		
START	4	Set WAVEFORM switch at SINE.	Dial illumination lamp lights.	Check fuse at rear of cabinet. Check dial lamp.
EQUIPMENT PERFORMANCE	5	Observe output at REF. output connectors; use an oscilloscope.	A square-wave output of 10 volts peak-to-peak should be present.	Check tubes (par. 21).
	6	With WAVEFORM switch at SINE, use the oscilloscope to check the waveform at the OUTPUT connector. Then rotate OUTPUT switch through each position from 10 through 100.	A sine wave should be observed with increase in amplitude from 9 to 30 volts minimum.	Check tubes (par. 21).
	7	Rotate FREQUENCY control through entire range for each position of FREQUENCY RANGE control.	Visual indication of frequency change should be apparent without major change in output amplitude.	Higher echelon calibration or repair is required.

	Step	Action or condition	Normal indications	Corrective measures
EQUIPMENT PERFORMANCE	8	Place WAVEFORM switch at SQUARE and observe the output with the oscilloscope. Rotate OUTPUT switch through each position from 10 through 100.	A square wave should be observed with increase in amplitude from 0 to 30 volts minimum.	Check tubes (par. 21).
	9	Place WAVEFORM switch at TRIANGLE and observe the OUTPUT with the oscilloscope. Rotate OUTPUT switch through each position from 10 through 100.	A triangular wave should be observed with increase in amplitude from 0 to 30 volts minimum.	Higher echelon maintenance is required.
	10	Connect the oscilloscope between GND and each of the OUTPUT terminals alternately and observe the relative amplitude of the signals.	Equal amplitude signals should be obtained between each OUTPUT terminal and GND.	Adjust dc balance control (fig. 5) until signals are equal in amplitude.

21. Tube Testing Procedures

a. General. When trouble occurs, check the power cable, fuse, and plug-in card connectors before removing any tubes. Remove the cover (par. 10*a*(1) through (3)) to reach the tubes and plug-in cards. If tube failure is suspected, use the procedure in *b* below to check V3, V5, and V6 only. If V5 or V6 is replaced, check the dc balance adjustment (par. 20*c*, step 10).

Cautions:

1. Do not interchange any tubes except V3, V5, or V6 since calibration of the signal generator at higher echelon would be required.

2. Do not rock or rotate a tube when removing it from the socket; pull it straight out with a tube puller.

b. Tube Substitution. Replace a suspected tube with a new tube. If the equipment is still abnormal, remove the new tube and replace the original tube. Repeat this procedure with each suspected tube until the defective tube is located.

22. Replacement of Dial Lamp and Fuse

Warning: Disconnect the power cord from the power source before attempting any repair. Voltages dangerous to life are present in the signal generator.

a. Replacement of Dial Lamp.

(1) Remove the cover from the chassis-panel assembly (par. 10*a* (1) through (3)).

(2) Press in on the lamp and turn it counterclockwise (ccw) approximately one-eighth inch. Pull the defective lamp out from socket.

(3) Insert the new lamp into the socket. Press in on the lamp and turn it clockwise (cw) to lock it in place.

(4) Replace the cover on the chassis-panel assembly.

b. Replacement of Fuse.

(1) Turn the fuseholder cap ccw until free from the fuseholder.

(2) Remove the defective fuse and replace it with good fuse with the same voltage and current ratings.

(3) Replace the fuseholder cap in the fuseholder and turn cw to secure.

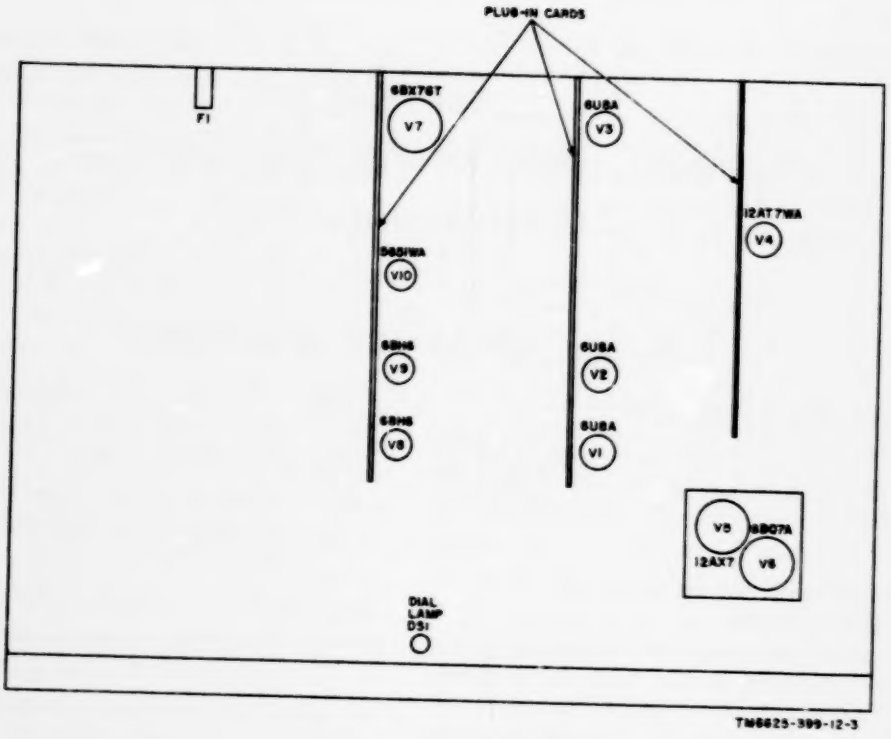


Figure 8. Tube locations.

CHAPTER 4

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

23. Preparation for Storage

Prepare the equipment for storage by coiling the power cord and securing it to either the top or rear of the signal generator cabinet with gummed tape.

24. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging the equipment depends on the material available and the conditions under which the equipment is to be stored. Adapt the procedures below whenever the circumstances permit. The information concerning the original packaging of this equipment is helpful (par. 8).

a. Material Requirements. The following materials are required for packaging the signal generator. For stock numbers of materials, refer to SB 38-100.

Material	Quantity
Cushioning material	16 sq ft
Fiberboard, corrugated	60 sq ft
Barrier material, waterproof	20 sq ft
Tape, pressure-sensitive	14 ft
Tape, gummed, paper	100 ft
Box, wooden 19 x 26 x 29 inches	1 ea
Box, fiberboard 11 x 18 x 21 inches	1 ea
Box, fiberboard 15 x 22 x 25 inches	1 ea
Desiccant	6 bags
Indicator, humidity	1 card
Strapping, steel	20 ft

b. Prepackaging.

(1) Wrap the signal generator in cushioning material and seal with gummed tape.

(2) Wrap the two technical manuals in waterproof barrier material and seal with gummed tape.

(3) Wrap the running spares in cushioning material and secure in one package with gummed tape.

c. Packaging. Package all items as follows:

(1) Place filler at the bottom of the inner corrugated fiberboard box.

(2) Place the signal generator in the inner box and place filler on all four sides and the top of the signal generator.

(3) Place desiccant bags and humidity indicator card in the top of the inner box.

(4) Close the inner box lid and seal with gummed tape.

(5) Line the inside of the outer box with a layer of waterproof barrier material.

(6) Place the inner box in the outer box and seal with waterproof barrier material gummed tape.

(7) Place the technical manuals in the outer box and seal the outer box with gummed tape.

(8) Place the outer box in the wooden box.

(9) Place the running spares in the wooden box.

(10) Place the cover on the wooden box and nail securely.

(11) Place the steel strapping around the box and fasten securely.

Section II. DEMOLITION TO PREVENT ENEMY USE

25. Authority for Demolition

The demolition procedures in paragraph 26 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

26. Methods of Destruction

Any or all of the methods of destruction below may be used. The time available will be the major factor for determining the methods to be used when destruction of the equipment is undertaken. The tactical situation also will determine how the destruction order will be carried out. It is preferable to completely demolish some portions of the equipment rather than to partially destroy the entire equipment.

a. Smash. Smash the controls, tubes, switches, dial, transformers, and spare parts; use sledges, axes, hammers, or any other heavy tools available.

b. Cut. Cut the power cord in several places; use axes or machetes.

c. Burn. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, etc. Burn the technical manuals, cabling, and spare parts; use incendiary grenades to complete the destruction of the signal generator interior.

Warning: **Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

d. Explode. Use explosives to complete demolition or to cause maximum damage before burning when time does not permit complete demolition by other means. Place an incendiary or fragmentation grenade inside the signal generator. Clear the area before the explosion takes place.

e. Dispose. Bury or scatter the destroyed parts in slit trenches or throw them into streams.

APPENDIX I

REFERENCES

Following is a list of references applicable and available to the operator and unit repairman of Generator, Signal SG-298/U.

SB 38-100 Preservation, Packaging, and Packing Materials, Supplies and Equipment used by the Army

TM 11-5129 Oscilloscopes AN/USM-50A, B, and C

APPENDIX II

MAINTENANCE ALLOCATION

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing. indicates the various maintennance functions allocated to the echslon capable of performing the operations.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(*a*) *Service.* To clean, to preserve, and to replenish fuel and lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute service assemblies, subassemblies, and parts for unserviceable components.

(*f*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(*g*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*i*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(*j*) *Overhaul.* To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible

for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

3. Maintenance by Using Organizations

When this equipment is used by signal organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
SIGNAL GENERATOR SG-298/U:								
	service		X				11	
	adjust				X		8,10	
	inspect		X					Visual only
	test					X	1,3,4,5,6,9	
					X		1,3,4,5,7,9	
	repair				X			
	calibrate				X		1,2,5	
	rebuild					X		

ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
SG-298/U (continued)							
ANELYZER, SPECTRUM TS-723/U				†	†	1	
FREQUENCY METER AN/USM-26				†	†	2	
MULTIMETER TS-352/U				†	†	3	
MULTIMETER METER ME-26/U				†	†	4	
OSCILLOSCOPE AN/USM-50				†	†	5	
TEST SET, ELECTRON TUBE TV-2/U					†	6	
TEST SET, ELECTRON TUBE TV-7/U				†		7	
TOOL EQUIPMENT TK-87/U				†	†	8	
VOLTMETER METER ME-30/U				†	†	9	
TOOL EQUIPMENT TK-88/U				†	†	10	
TOOLS AND TEST EQUIPMENT NORMALLY SUPPLIED TO THE USER REPAIRMAN BECAUSE OF HIS ASSIGNED MISSION		†				11	

APPENDIX III

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part of* the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

a. Source, Maintenance, and Recoverability Code. Not used.

b. Federal Stock Number. This column lists the 11-digit Federal stock number. In the absence of a Federal stock number, an iterim number, for example ††L8Ra41C-12 in the description column, indicates that a Federal stock number is being processed for assignment. The L number may be used in emergencies to identify items.

c. Designation by Model. Not used.

d. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

e. Unit of Issue. The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

f. Expendability. Nonexpendable items are indicated by NX.

g. Quantity Authorized. Under "Items Comprising an Operable Equipment", the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items", the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

h. Illustrations. Not used.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
			SIGNAL GENERATOR SG-298/U					
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			SIGNAL GENERATOR SG-298/U: Freq .008 to 2000 cps; 4000 ohms imp; 115/230 V, 50/1000 cps input power; 17 in w x 7 in h x 14 1/2 in d; Paraban Model No. WI ++L1Se26-1					
			SIGNAL GENERATOR SG-298/U (BASIC COMPONENT)			1		
	Ord thru AGC		TECHNICAL MANUAL TM 11-6625-399-12			2		
			RUNNING SPARES AND ACCESSORY ITEMS					
			SIGNAL GENERATOR SG-298/U					
	5960-262-0167		ELECTRON TUBE: MIL type 12AT7WA			1		
	5960-188-3602		ELECTRON TUBE: MIL type 6BH6			1		
	5960-262-0286		ELECTRON TUBE: MIL type 5651WA			1		
	5960-262-3781		ELECTRON TUBE: RETMA No. 6BQ7A			1		
	5960-543-0966		ELECTRON TUBE: RCA type No. 6U8A			1		
	5960-615-0057		ELECTRON TUBE: GE type No. 6BX7GT			1		
	5960-636-0106		ELECTRON TUBE: MIL type 12AX7			5		
	5920-280-5062		FUSE: MIL type MS-90078-11			1		
			LAMP: MIL type MS-15571-8 ++L1Se26-64					

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USAEPG (2)
EMC (1)
USACA (2)
USASEA (1)
USA Caribbean Sig Agcy (1)
USA Sig Msl Spt Agcy (12)
USASSA (20)
USASSAMRO (1)
Army Pictorial Cen (2)
USAOMC (3)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
OSA (1)
AMS (1)
Sig Fld Maint Shops (2)
JBUSMC (2)
Units org under fol TOE:
Two copies to each unit unless
otherwise indicated:
11-7
11-16
11-57
11-97
11-117
11-155
11-500 (AA-AE) (4)
11-557
11-587
11-592
11-597

NG: State AG (3); Units — Same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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